«Utilization of natural anthocyanins from tulip flowers in cosmetics»

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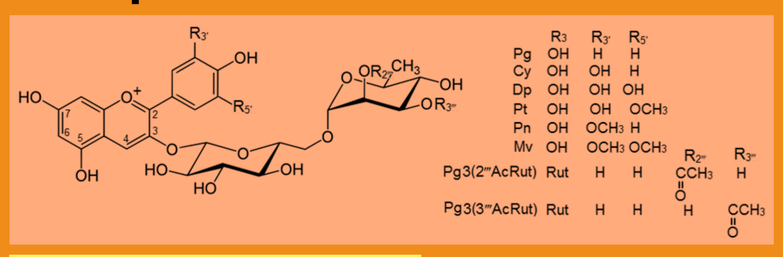
GOAL

Production of dry encapsulated forms of anthocyanins from tulip petals with high antioxidant activity and their utilization in lipsticks.

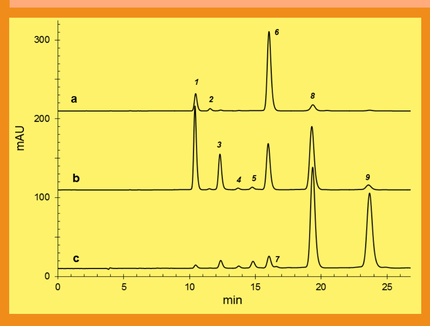
INTRODUCTION

Anthocyanins (of the Greek anthos = flower and kianos = blue) are the most important pigments of the plants. These pigments are responsible of the shiny orange, pink, red, violet and blue colors in the flowers and fruits of some plants. The most interesting substances of the waste material are anthocyanins as natural water soluble antioxidants with a great health benefit besides the coloring properties.

Tulip is a perennial bulbous plant which is popular worldwide and especially in the Holland due to the showy flowers of the great variety of colors and shades. It was found that for flowers of different colors biosynthesis of anthocyanins of the three anthocyanidin backbones may occur. Thus, pelargonidin (Pg), cyanidin (Cy) and delphinidin (Dp) derivatives, are responsible for tulip flowers color

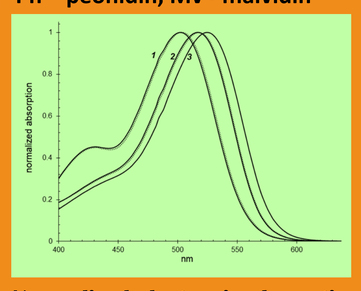


Structure of six common anthocyanidins and acetylated 3-rutinosides on the example of pelargonidin derivatives.
Pg – pelargonidin, Cy – cyanidin,
Dp – delphinidin, Pt – petunidin,
Pn – peonidin, Mv - malvidin



Separation of anthocyanins of tulip flower petals of three cultivars by HILIC

Mobile phase composition: acetonitrile-phosphoric acid-water (85.0 – 0.5 – 14.5 vol.%). Cultivars:
a) - "Apricot impression";
b) – "Bon van Zanten";
c) – "Purple dream".
Solutes: 1 – Pg3(2‴AcRut) and Pg3((3‴AcRut),
2 – Pg3Glu, 3 – Cy3((2‴AcRut) and Cy3(3‴AcRut),
4 – Cy3Glu; 5 – Dp3(2‴AcRut) and Dp3(2‴AcRut), 6 – Pg3Rut, 7 – Dp3Glu; 8 – Cy3Rut; 9 – Dp3Rut.

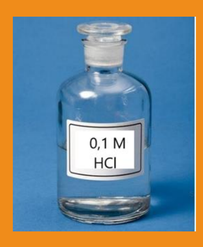


Normalized electronic absorption spectra of main tulip petal anthocyanins. 1 – Pg3Rut, 2 – Cy3Rut; 3 – Pg3Rut. Doted lines for acetylated anthocyanins.

SOURCES OF THE ANTHOCYANINS

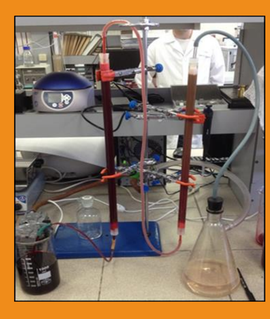
PHASES OF OBTAINING NATURAL DYES

Extraction



Purification

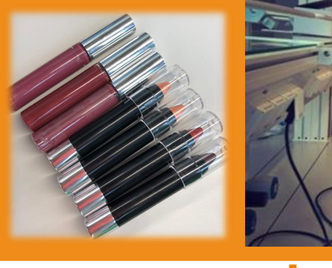
or



Concentration

Drying

Application



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